

Dialysis Membrane with Improved Removal of Middle Molecules

Abstract

A hydrophilic semipermeable hollow-fibre membrane for blood treatment, with an integrally asymmetric structure based on a synthetic polymer. The hollow-fibre membrane possesses on its inner surface a separating layer and an adjoining open-pored supporting layer, and has an ultrafiltration rate in albumin solution of 5 to 25 ml/(h·m²·mmHg). The hollow-fibre membrane is free from pore-stabilising additives and has a maximum sieving coefficient for albumin of 0.005 and a sieving coefficient for cytochrome c that satisfies the equation

$$SC_{CC} \geq 5 \cdot 10^{-5} \cdot UFR_{Alb}^3 - 0.004 \cdot UFR_{Alb}^2 + 1.081 \cdot UFR_{Alb} - 0.25$$

A method for producing such membranes by a coagulation process induced by a non-solvent, in which a spinning solution comprising a synthetic first polymer and possibly a hydrophilic second polymer is extruded through the annular slit of a hollow-fibre die to give a hollow fibre, and a coagulation medium that initiates coagulation in the interior of the hollow fibre is simultaneously extruded through the central opening of the hollow-fibre die, the coagulation medium initiating coagulation in the interior of the hollow fibre for formation of a separating layer on the inner surface of the hollow fibre and formation of the membrane structure, the method being characterised in that the interior filler contains a polyelectrolyte with negative fixed charges.